

# Journal of Materials Chemistry C

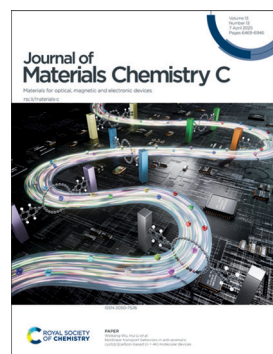
Materials for optical, magnetic and electronic devices

[rsc.li/materials-c](http://rsc.li/materials-c)

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

## IN THIS ISSUE

ISSN 2050-7526 CODEN JMCCCX 13(13) 6469-6946 (2025)



### Cover

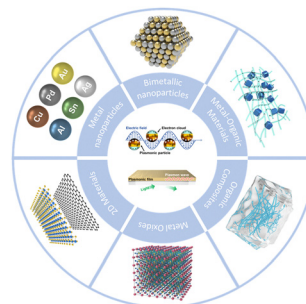
See Weikang Wu, Hui Li *et al.*, pp. 6527–6538.  
Image reproduced by permission of Hui Li from *J. Mater. Chem. C*, 2025, 13, 6527.

## REVIEW

6484

### Advancements in surface plasmon resonance sensors for real-time detection of chemical analytes: sensing materials and applications

Sung Hwan Cho, Seungwon Choi, Jun Min Suh and Ho Won Jang\*

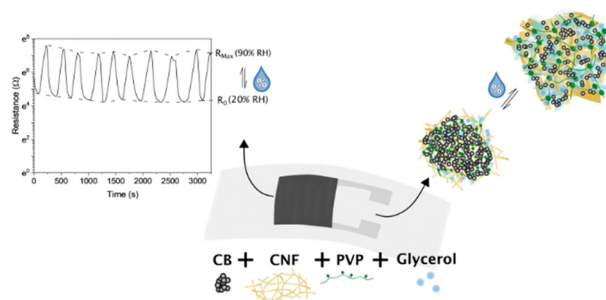


## COMMUNICATION

6508

### Flexible CNF/CB-based humidity sensors with optimized sensitivity and performance

Cláudia Buga and Júlio Viana\*



# Advance your career in science

with professional recognition that showcases  
your **experience, expertise and dedication**

## Stand out from the crowd

Prove your commitment  
to attaining excellence in  
your field

## Gain the recognition you deserve

Achieve a professional  
qualification that inspires  
confidence and trust

## Unlock your career potential

Apply for our professional  
registers (RSci, RSciTech)  
or chartered status  
(CChem, CSci, CEnv)

## Apply now

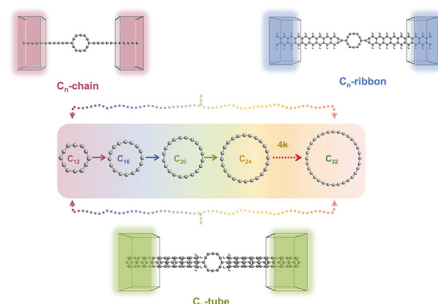
[rsc.li/professional-development](https://rsc.li/professional-development)



6527

### Nonlinear transport behaviors in anti-aromatic cyclo[ $n$ ]carbon-based ( $n = 4k$ ) molecular devices

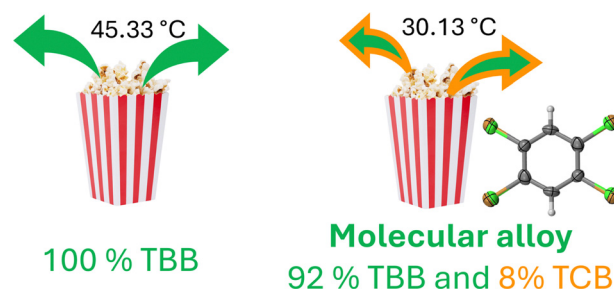
Junnan Guo, Wenhui Fang, Jian Huang, Lishu Zhang, Weikang Wu\* and Hui Li\*



6539

### Tetrabromobenzene-based molecular alloys – a tool for tailoring the temperature of the thermosalient phase transition

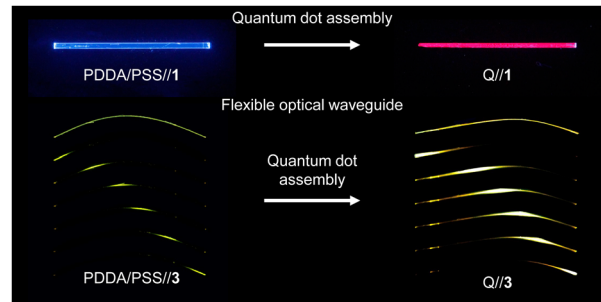
Teodoro Klaser, Oskar Stepančić, Jasminka Popović, Jana Pisk, Luka Pavić, Igor Picek, Dubravka Matković-Čalogović and Željko Skoko\*



6547

### Flexible organic crystal-quantum dot hybrids with adjustable waveguides

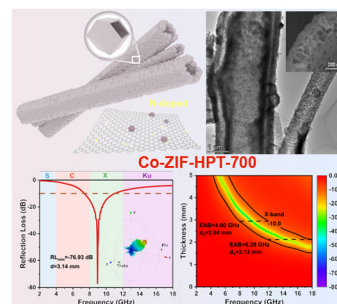
Xuesong Yang, Boyang Gao, Yi Liu, Baolei Tang,\* Hao Zhang\* and Hongyu Zhang\*



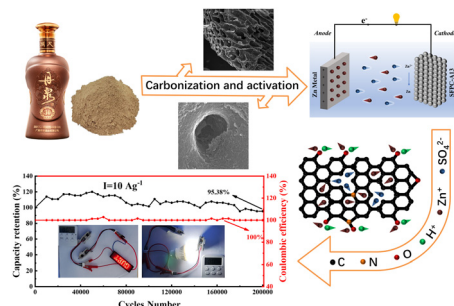
6556

### Hollowing integration engineering to construct MOF-derived carbon composites for lightweight and efficient microwave absorption materials

Zhe Zhang, Jiewu Cui,\* Dongbo Yu, Pengjie Zhang, Wei Sun, Yong Zhang, Song Ma, Xiaohui Liang and Yucheng Wu\*



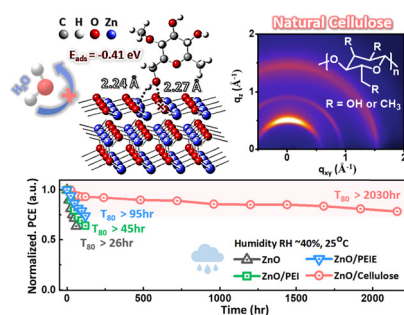
6569



### Transforming biomass waste sauce-flavor liquor lees into porous carbons for high-performance aqueous zinc-ion hybrid capacitors

Guimei Wei, Ye Tian, Xingning Tang, Weihua Yin, Hongliang Peng,\* Lixian Sun,\* Guanghua Wang, Fen Xu, Yongjin Zou, Huanzhi Zhang and Ping Cai\*

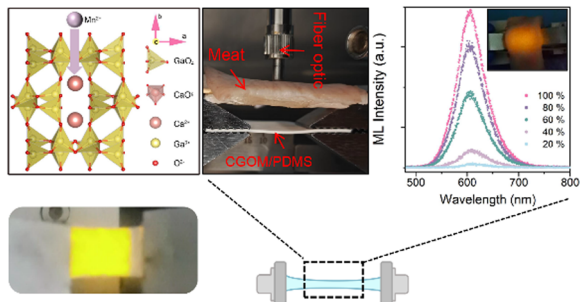
6581



### Boosting the long-term stability of all-polymer solar cells by using natural cellulose as an interlayer

Guan-Lin Chen, Po-Tuan Chen, Ching-I Huang\* and Leeyih Wang\*

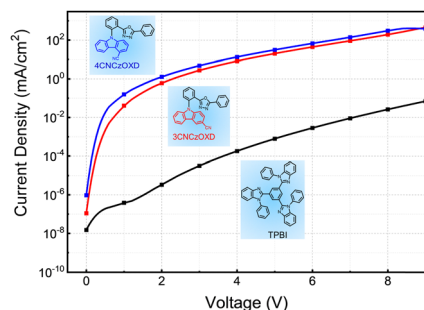
6588



### Intense and repeatable orange mechanoluminescence of Mn<sup>2+</sup> activated CaGa<sub>4</sub>O<sub>7</sub> for visualized mechanics sensing

Yongwen He, Jie Wang, Shaofan Fang,\* Junshan Qin, Long Feng, Birong Tian, Shaowei Feng\* and Zhaofeng Wang\*

6598



### Carbazole derivatives as electron transport and n-type acceptor materials for efficient organic light-emitting devices

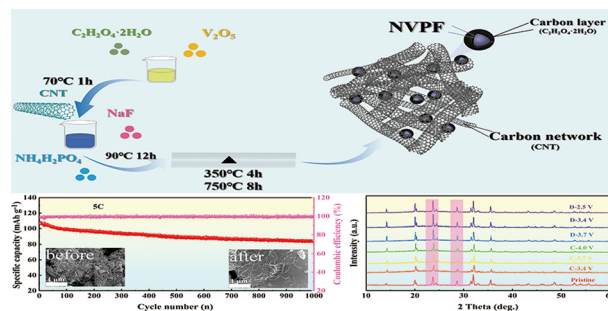
Shiyong Hu, Yaotian Zhang, Jingsheng Wang, Yuying Wu, Yeting Tao, Wenbo Yuan and Youtian Tao\*



6605

## Multilevel carbon composite construction of NASICON-type $\text{NaVPO}_4\text{F}/\text{C}/\text{CNT}$ cathode material for enhanced-performance sodium-ion batteries

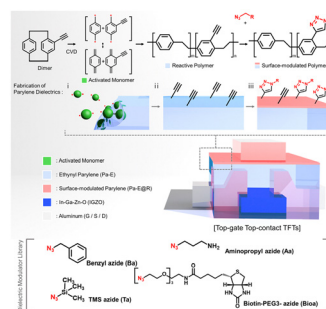
Kang Tang, Hualing Tian, Yanhui Zhang, Yanjun Cai, Hong Du, Mofan Zhu, Xiang Yao\* and Zhi Su\*



6614

## Tunable dielectric properties of a parylene dielectric layer through surface-modulation by click chemistry

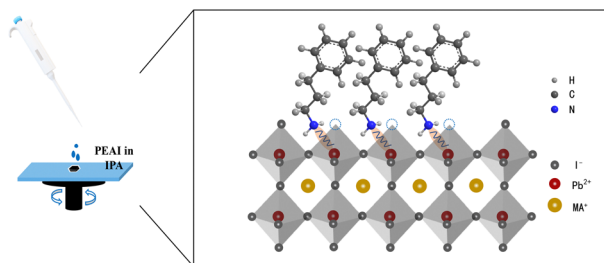
Seong Cheol Jang, Gunoh Lee, Ilhoon Park, Byeongil Noh, Ji-Min Park, Jaewon Lee, Kyung Jin Lee\* and Hyun-Suk Kim\*



6624

## *In situ* formation of a low-dimensional perovskite structure for efficient single-crystal $\text{MAPbI}_3$ solar cells with enhanced ambient stability

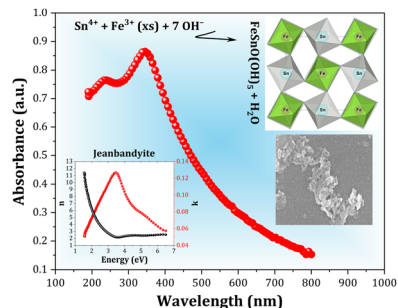
Mingxun Liu, Xinbo Guo, Nianqiao Liu, Changke Jiang, Jian Zhang, Zhaolai Chen and Yu Zhong\*



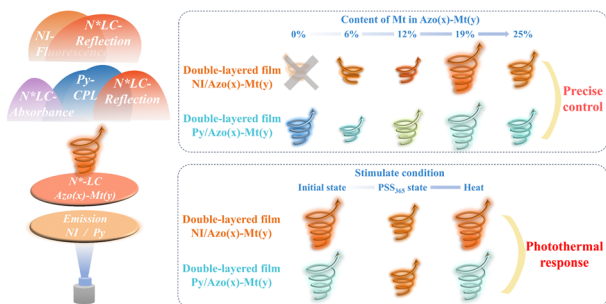
6630

## Linear and non-linear optical properties of $\text{FeSnO}(\text{OH})_5$ oxyhydroxide perovskite

Abdelhadi El Hachmi,\* Goutam Biswas, Subhadeep Sen, Bouchaib Manoun, Khalid Draoui and Zouhair Sadoune



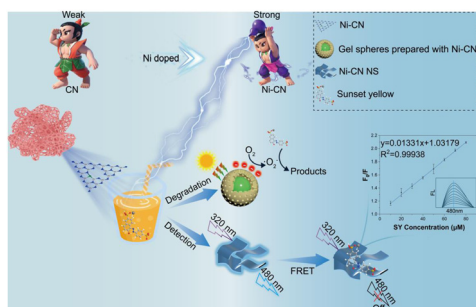
6641



### Photothermal response and precise control of circularly polarized luminescence *via* double-layered films based on cholesteric liquid crystals

Sha Huang, Qimei Wu, Yongjie Hu, Xincan Wang, Yongjie Yuan\* and Hailiang Zhang\*

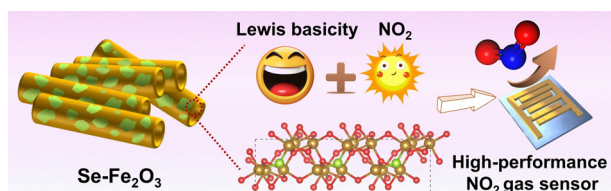
6650



### Coral-like porous tubular Ni doped g-C<sub>3</sub>N<sub>4</sub> nanocomposites as bifunctional templates for photocatalytic degradation and fluorescence detection of sunset yellow in beverages

Yue Li, Ping Liu, Shisen Li, Yanting Ren, Wenzhen Du, Wenjing Yin, Haiyan Jiang, Qingli Yang and Yongchao Ma\*

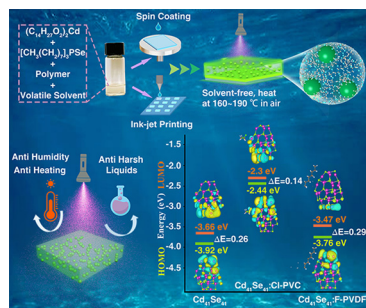
6660



### Selenium-doped hematite ( $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>) hollow nanorods for highly sensitive and selective detection of trace NO<sub>2</sub>

Tingting Liang, Yan Li, Xu Zhang, Hongwei Bao, Fengnan Li, Xueqian Liu, Zhengfei Dai and Hang Liu\*

6669



### *In situ* synthesis of cadmium selenide quantum dots in solvent-free polymer templates demonstrating stable photoluminescence in a harsh atmosphere

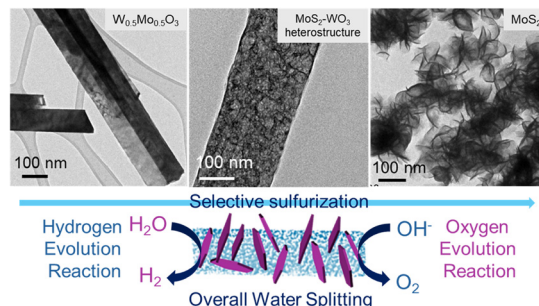
Qiao Wang, Wenfei Shen, Jin Liu, Fan Gao, Yao Wang, Yanxin Wang, Zhonglin Du, Linjun Huang, Mikhail Artemyev, Haijiao Xie, Jun Li, Laurence A. Belfiore and Jianguo Tang\*



6678

## Transforming $\text{Mo}_{0.5}\text{W}_{0.5}\text{O}_3$ to $\text{MoS}_2$ : leveraging selective sulfurization for enhanced electrocatalysis

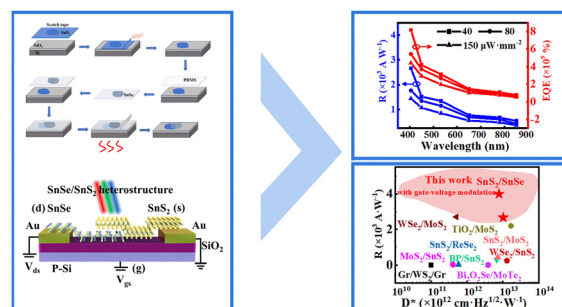
Naveen Goyal, Gokul Raj, Karuna Kar Nanda and N. Ravishankar\*



6693

## High-performance visible-to-near infrared phototransistor based on $\text{SnSe}/\text{SnS}_2$ van der Waals heterostructure

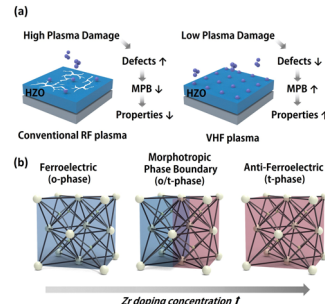
Gaoning Fan, Weishuai Duan, Mengjiao Dong, Xueting Luo, Pengyu Zhou,\* Chun Sun, Yonghui Zhang, Mengjun Wang and Chao Fan\*



6702

## Very high frequency ( $\sim 100$ MHz) plasma enhanced atomic layer deposition high- $\kappa$ hafnium zirconium oxide capacitors near morphotropic phase boundary with low current density & high- $\kappa$ for DRAM technology

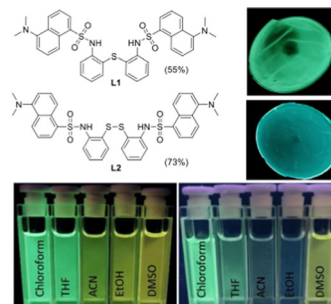
Ketong Yang, Hunbeom Shin, Seungyeob Kim, Taeseung Jung and Sanghun Jeon\*



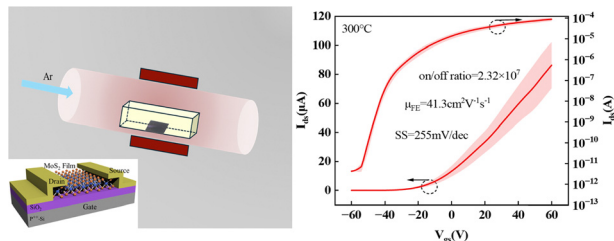
6708

## Design and evaluation of dansyl-derived chemosensors for disulfide-cleavage-triggered detection: photophysical, metal sensing, and thermometric applications

Igor Lourenço, Frederico Duarte, Georgi M. Dobrikov, Atanas Kurutos,\* Ivaylo Slavchev, José Luis Capelo-Martínez, Hugo M. Santos and Carlos Lodeiro\*



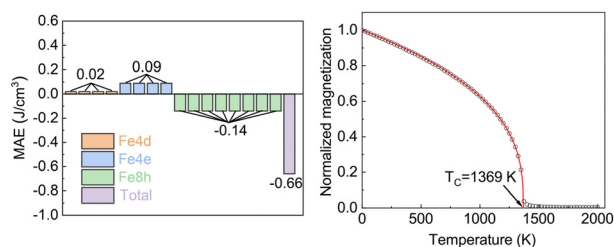
6720



### Reducing MoS<sub>2</sub> FET contact resistance by stepped annealing to optimize device performance

Peng Liu, Xin Lin, Zewen Li, Dianyou Song,\* Fang Wang,\* Yan Cheng, Sannian Song and Kailiang Zhang\*

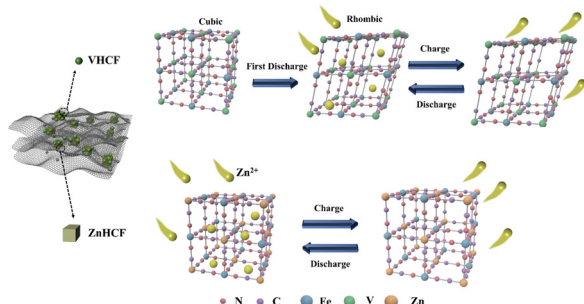
6728



### Electronic structures and magnetic properties of the rare-earth-free permanent magnet $\alpha''$ -Fe<sub>16</sub>N<sub>2</sub>: first-principles calculations

Peirun Duan, Qingming Ping, Douqiang Sun, Qihang Luo, Haojie Li, Haoyu Xu, Xian Liu, Xiaohui Shi\* and Lulu Du\*

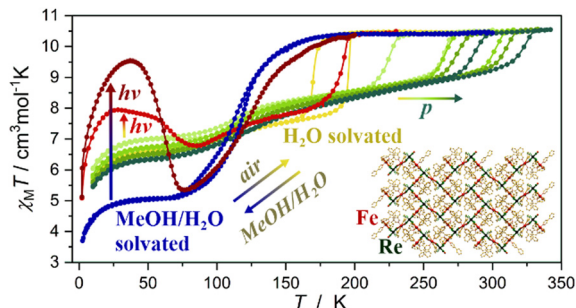
6736



### Conductive network enhanced self-assembled diphasic Prussian blue analogs for aqueous zinc-ion batteries

Bingbing Hu,\* Dongshan Li, Meixin Li, Jiayu Jiang, Ye Zou, Yu Deng, Zideng Zhou, Hong Pu, Guangqiang Ma and Zhi Li\*

6745



### Chemically driven magnetic responsivity to multiple physical stimuli in a spin-crossover layered iron(II)-rhenium(V) framework

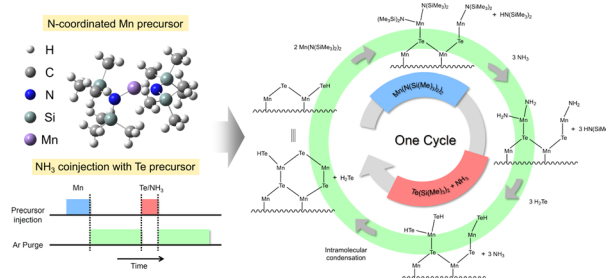
Tomasz Charytanowicz, Michał Heczko, Katarzyna Dziedzic-Kocurek, Dawid Pinkowicz, Shin-ichi Ohkoshi, Szymon Chorazy\* and Barbara Sieklucka\*



6762

## Low-temperature atomic layer deposition of metastable MnTe films for phase change memory devices

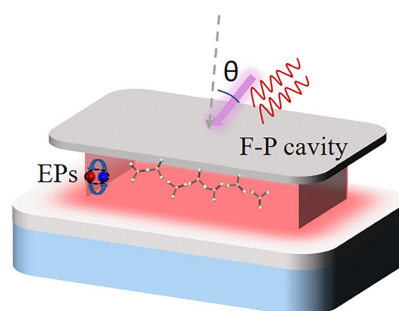
Gwangsik Jeon, Jeongwoo Jeon, Woohyun Kim, Daehyeon Kim, Wontae Noh, Wonho Choi, Byongwoo Park, Sangmin Jeon, Sungjin Kim, Chanyoung Yoo\* and Cheol Seong Hwang\*



6772

## Polariton emission properties of an organic dye-doped polymer microcavity

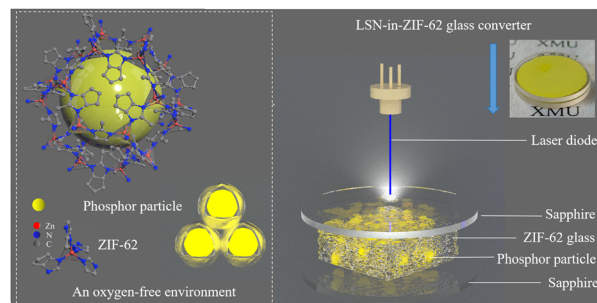
Lulu Xue, Ziyang Chen, Yatong Zhang, Xiaoya Yan, Liang Zhao, Pengxue Jia, Bo Gao\* and Hongyan Shi\*



6779

## Fabrication of loss-less $\text{La}_2\text{Si}_6\text{N}_{11}:\text{Ce}^{3+}$ phosphor-in-glass color converters using oxygen-free ZIF-62 glass

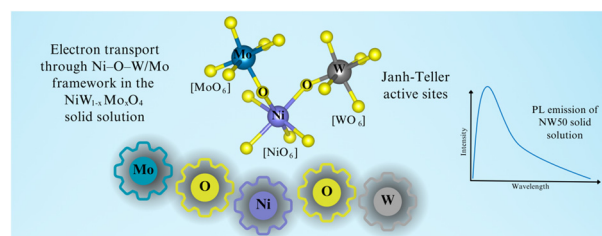
Taoli Deng, Zan Ding, Shuang Zheng and Rong-Jun Xie\*



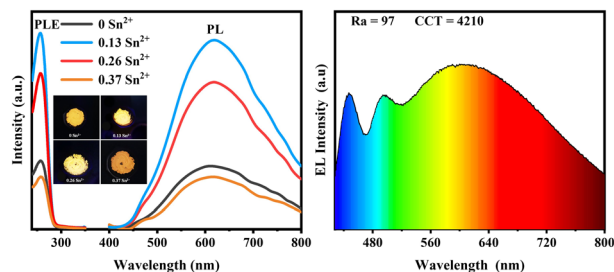
6788

## Disentangling the structure, optical properties, and photoluminescence emissions of $\text{NiW}_{1-x}\text{Mo}_x\text{O}_4$ ( $x = 25, 50,$ and $75\%$ ) solid solutions: experimental and DFT studies

Amanda Fernandes Gouveia,\* Marcelo Assis, Lara Kelly Ribeiro, Eduardo de Oliveira Gomes, Marcio Daldin Teodoro, Elson Longo and Juan Andrés\*



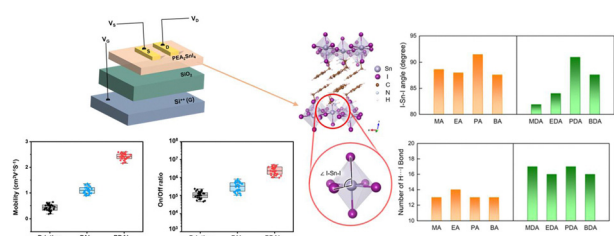
6799



### Highly efficient orange luminescence in $\text{Sn}^{2+}$ -doped $\text{Cs}_2\text{AgInCl}_6$ double perovskite with a large Stokes shift

Jingrui Guo, Jing Guo,\* Yuchen Peng, Jiajia Wang, Weidan Ma, Na Zhang, Yan Zhang, Yufeng Liu\* and Yongzheng Fang\*

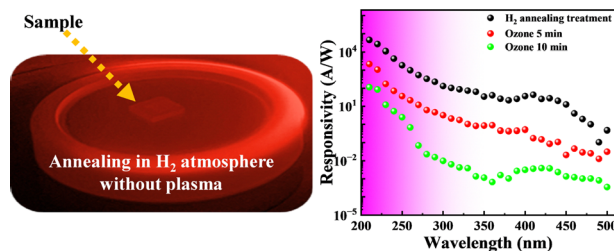
6806



### Alkylammonium passivation for 2D tin halide perovskite field-effect transistors

Hakjun Kim, Cheong Beom Lee, Bum Ho Jeong, Jongmin Lee, Jia Choi, Kyeounghak Kim\* and Hui Joon Park\*

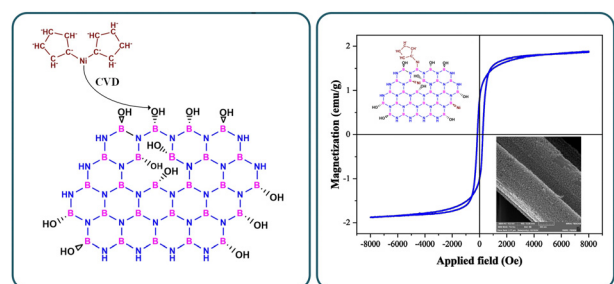
6816



### Photo-response performance regulation of a type-Ib diamond-based photodetector by $\text{H}_2$ annealing and ozone treatment

Keyun Gu, Zilong Zhang, Takeo Ohsawa, Masataka Imura, Jian Huang,\* Yasuo Koide and Meiyong Liao\*

6823



### Nickel-deposited hexagonal boron nitride composites synthesized via chemical vapor deposition: unlocking enhanced magnetic properties for advanced technologies

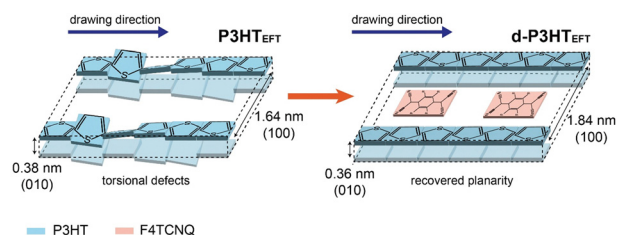
Samira Mehravar, Benyamin M. Garmejani and Shohreh Fatemi\*



6831

### Self-healing of defects in uniaxially aligned semiconducting polymer crystals *via* molecular doping: insights into crystallization from transient vs. settled amorphous phases

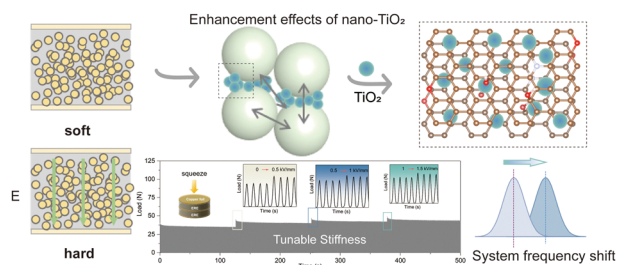
Hokyeong Jeong, Sangwon Eom, Sanghoon Cho, Thanh Van Vu, Jae Hyun Sim, Jinwoo Choi, Seungjoo Park, Sangho Kim, Sangeun Baek, Hyunmin Lee, Hoeil Chung and Youngjong Kang\*



6842

### Electrorheological elastomer for simultaneous enhancements in durability and micro-vibration suppression

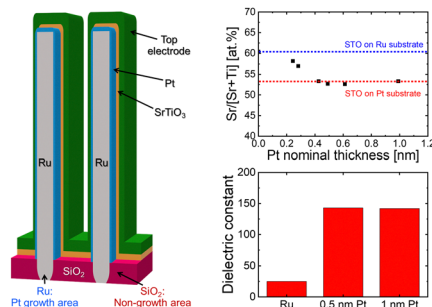
Sai Chen, Leizhi Wang, Ke Zhang,\* Wen Bai and Yao Li



6851

### Enhancing the crystallinity and dielectric performance of ALD-grown SrTiO<sub>3</sub> films by introducing a sub-nm-thick Pt layer

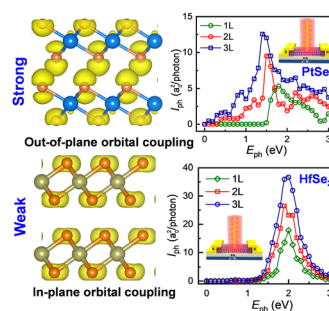
Hong Keun Chung, Jihoon Jeon, Seungwan Ye, Sung-Chul Kim, Sung Ok Won, Tae Joo Park and Seong Keun Kim\*



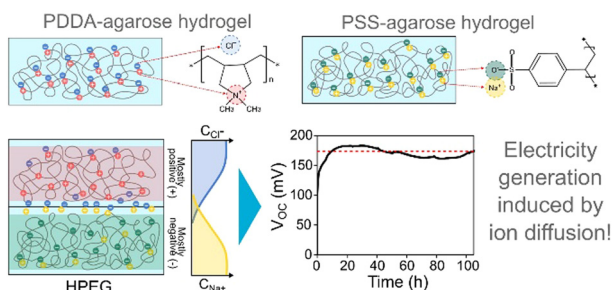
6859

### Unraveling the interlayer coupling effect on layer-dependent electronic and optoelectronic properties in two-dimensional semiconductors

Zeqi Hua, Haibo Shu,\* Dabao Xie, Zehao Liu, Jiayu Liang,\* Jing Zhou, Xiaoshuang Chen and Dan Cao



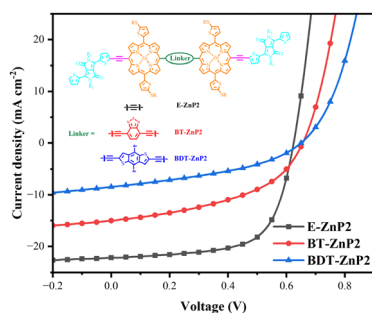
6870



### A hydrogel-ionic polymer blend for humidity-insensitive ion gradient driven electricity generation

Byeunggon Kim, Paniz Faramarzi, Jeong Hyo Kim, Wonik Jang, Youngmin Yoo\* and Jae Bem You\*

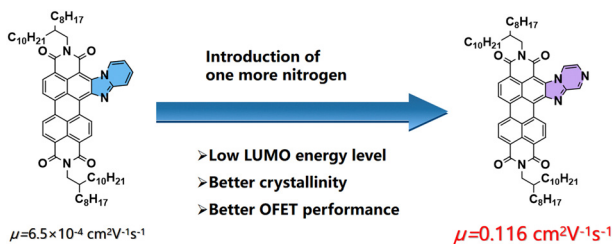
6880



### Impacts of linking units of porphyrin dimer donors on the performance of organic solar cells

Hanping Wu, Jifa Wu, Feng Tang, Lin Yuan, Yinchun Guo, Yumeng Li and Xiaobin Peng\*

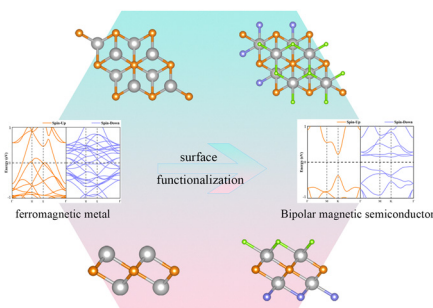
6888



### *ortho*- $\pi$ -Extension of perylene diimides via one-pot annulation of imidazo[1,2-*a*]pyridine or imidazo[1,2-*a*]pyrazine for n-type organic field-effect transistors

Yinxiang Liao, Cui Wang, Luyao Dai, Guangwei Shao, Xingyu Chen, Di Wu\* and Jianlong Xia\*

6896



### Engineering the electronic structures and ferromagnetism of Fe<sub>2</sub>C monolayers via surface functionalization

Xiaolong He, Yaya Lou, Dongni Wu and Jing Xie\*



6907

### AIEE active dual-state emissive tripodal pyridopyrazine derivatives as multi-stimuli responsive smart organic materials

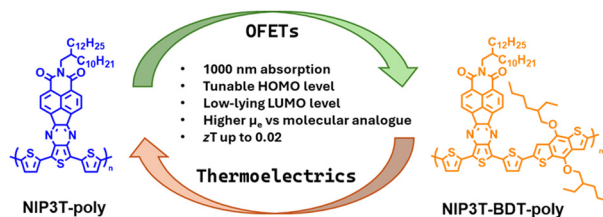
Monika Lamoria, Debashree Manna and Marilyn Daisy Milton\*



6922

### Low-bandgap oligothiophene-naphthalimide oligomeric semiconductors for thermoelectric applications

Matias J. Alonso-Navarro, Osnat Zapata-Arteaga, Sergi Riera-Galindo, Jiali Guo, Aleksandr-Peredevev, Edgar Gutiérrez-Fernández, Juan Sebastián Reparaz, Mar Ramos, Christian Müller, Jaime Martín, Marta Mas-Torrent, José L. Segura\* and Mariano Campoy-Quiles\*



6933

### Promotion of electrochemical reduction of CO<sub>2</sub> over the Cu<sub>2</sub>O–Cu(111) interface assisted by oxygen vacancies

Shuang Xu, Lei Yang, Congya Wang, Liwei Pan, Jing Zhang, Yaling Wang and Hexiang Zhong\*

